



NASA Coastal Observation Research Experience

Wallops Flight Facility

Boat Research Trip #2

Thursday, July 14, 2011

8:30 A.M.-11:30 A.M.

Introduction: As part of the workshop, we will be taking two boat cruises off of Wallops Island and Chincoteague Island. The main purpose of these cruises is to have you become familiar with some of the simple, yet scientifically important research techniques used by scientists to study our coastal waters and ecosystems. These research techniques can also serve as further ground validation for satellite data results.

We will be comparing the results taken from two separate days in order to better understand the significance of these research techniques. By comparing two separate days of data, we can reach better results. We will be utilizing instrumentation on the boat and in a laboratory.



Tools we will be using:

Individual Groups:

- **Niskin Bottles**
 - a device for obtaining samples of seawater at a specific depth
- **Secchi Disk**
 - a circular disk used to measure water transparency in oceans and lakes
- **Phytoplankton Filter**
 - an instrument used to filter water for phytoplankton
- **Spectrometer**
 - an instrument used for measuring wavelengths or indexes of refraction
- **Thermometer**
 - an instrument used to measure temperature at a given location

Large Group:

- **Trawling Net**
 - a net that drags along the sea bottom to catch the fish living there
- **Plankton Net**
 - a small net for collecting plankton
- **Benthic Grab**
 - an instrument that grabs the sediment surface to collect bottom organisms
- **PAR Meter**
 - an instrument used for measuring the amount of light, or Photosynthetically Active Radiation, between 400 nm and 700 nm

Directions for Individual Group Activities-Trip 2

1. We will be stopping at 5 separate marine locations and each group will be responsible for collecting data at each stop.
2. Ask the boat captain for the latitude and longitude at each stop and record on your table.
3. Record observations of what you did at each stop.
4. Fill in each table at each Stop and get data from each group.
 - a. Stop 1
 - i. Group 1: Niskin bottle/plastic bottles water collection
 - ii. Group 2: Secchi Disk
 - iii. Group 3: Filter plankton (hand pump)
 - iv. Group 4: Spectrometer
 - v. Group 5: Thermometer
 - b. Stop 2
 - i. Group 1: Secchi Disk
 - ii. Group 2: Filter plankton (hand pump)
 - iii. Group 3: Spectrometer
 - iv. Group 4: Thermometer
 - v. Group 5: Niskin bottle/plastic bottles water collection
 - vi.
 - c. Stop 3
 - i. Group 1: Filter plankton (hand pump)
 - ii. Group 2: Spectrometer
 - iii. Group 3: Thermometer
 - iv. Group 4: Niskin bottle/plastic bottles water collection
 - v. Group 5: Secchi Disk
 - d. Stop 4
 - i. Group 1: Spectrometer
 - ii. Group 2: Thermometer
 - iii. Group 3: Niskin bottle/plastic bottles water collection
 - iv. Group 4: Secchi Disk
 - v. Group 5: Filter plankton (hand pump)
 - e. Stop 5
 - i. Group 1: Thermometer
 - ii. Group 2: Niskin bottle/plastic bottles water collection
 - iii. Group 3: Secchi Disk
 - iv. Group 4: Filter plankton (hand pump)
 - v. Group 5: Spectrometer

Day 2 Cruise Data Chart	Stop 1-Day 2	Stop 2-Day 2	Stop 3-Day 2	Stop 4-Day 2	Stop 5-Day 2
Latitude Longitude					
Amount of water collected-Niskin bottle/plastic bottles (ml)					
Water Transparency Depth-Secchi Disk (ft)					
Plankton water filtering (ml)					
Spectrometer Data Plot (Time of Day)					
Temperature (C)					

Weather Observations

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Large Group Activities-Trawling Net and Benthic Grab-Trip 2

These instruments will be used when the boat is moving and we will observe what is brought from each while on the boat. We will also discuss how we used the Phyto Net and what we can get/see from it.

1. Record what you see from the Trawling Net

Trawling Net Observations

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2. Record what you see from the Benthic Grab

Benthic Grab Observations

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In the Lab-Trip 2: Thursday, July 14, 2011, 2:45 P.M.-4:00 P.M.

In original groups, we will compare and contrast the results each group has gotten and write up the observations on the blackboard.

Activity 1: Phytoplankton Filtering

Steps:

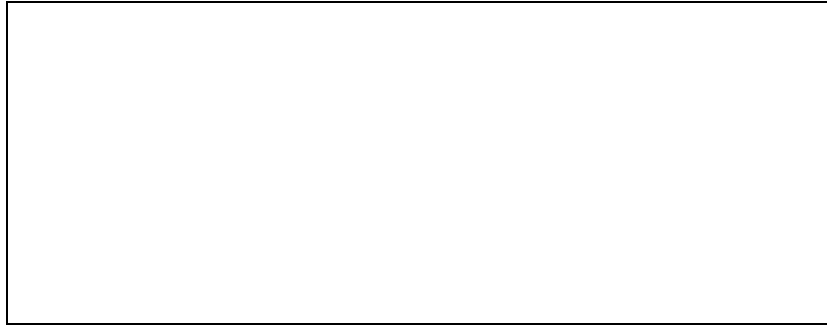
1. We will use the large filtering platform and electric pump to filter water samples collected.
2. Create a slide from the water collected from Niskin Bottles and plastic bottles and view under microscope under microscope.
3. Draw what you see under the microscope.

Microscope Observations
Collected

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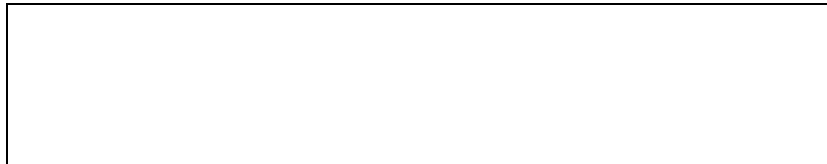
4. View commercially-prepared of phytoplankton.
5. Draw what you see under the microscope.

Microscope Observations
Prepared



6. What differences and/or similarities do you see in the slides from the water you collected versus the commercially-prepared slides.

Differences



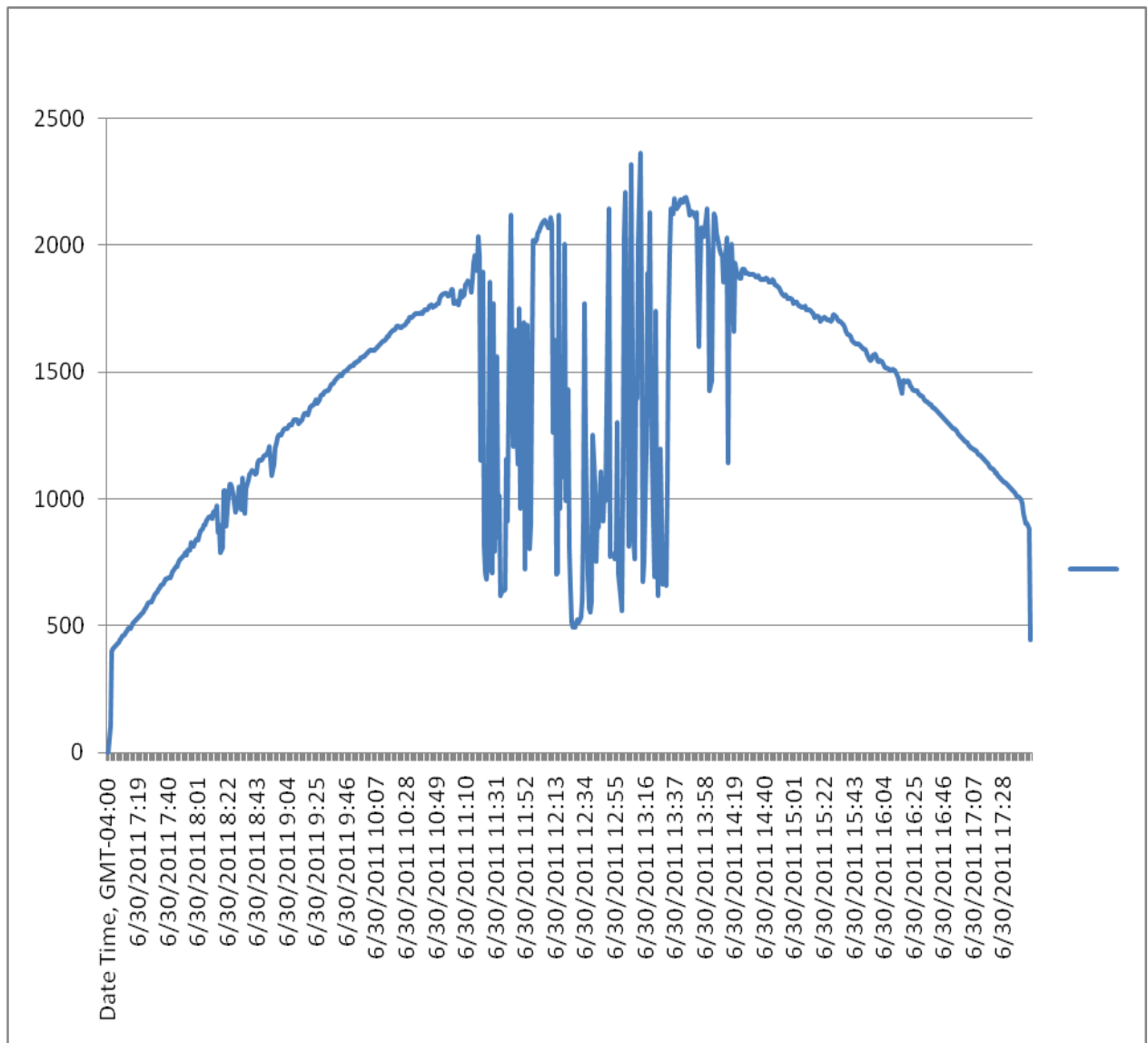
Similarities



Graphing Data

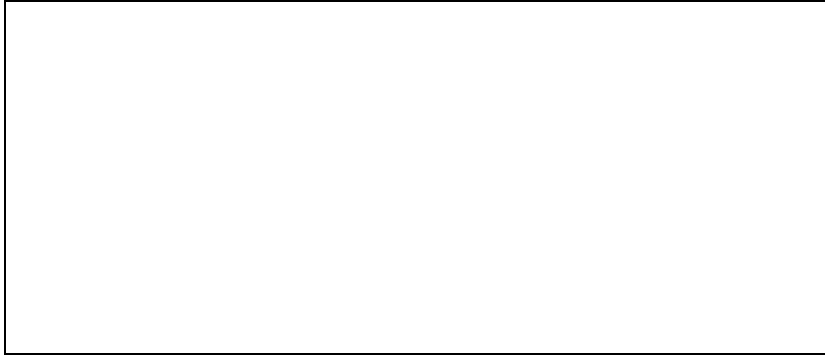
Plot light data from PAR meter: PAR stands for Photosynthetically-Active Radiation, or the amount of light particles between 400nm and 700nm. This is the range of light wavelengths that can be used for photosynthesis.

Example:



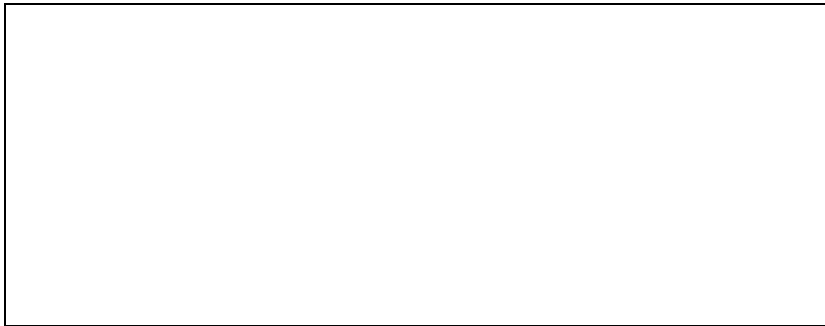
Draw what the PAR curve looks like

Photosynthetically Active
Radiation (PAR)



Try to comment on how the curve relates to what the weather was like that day

Comments



Questions for Discussion:

- 1.) Why might it be necessary for scientists to research at a specific location along the coastal oceans?

- 2.) What do the coastal oceans tell us?

- 3.) Can you think of how the coastal oceans can serve as an indicator of climate change?